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EXAMINER

SHAPIRO, LEONID

ART UNIT PAPER NUMBER

2677

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/921,583

Applicant(s)

YATABE, SATOSHI

Examiner

Leonid Shapiro

Art Unit

2673

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 4-6, 9-15 is/are rejected.
- 7) ☒ Claim(s) 2, 3, 7 and 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 4, 6, 9, 11, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rader (US Patent No. 5867140) in view of Kumagawa et al. (US Patent No. 6,663,272 B1) and Kudo et al. (US Patent No. 5,861,863) and Takahara et al. (US Patent No. 6,545,653 B1).

As to claim 1, Rader teaches a driving method of a display device for driving pixels are arranged at each of intersections of a plurality of scanning lines and plurality of data lines (See Fig. 3, items 200, 311, 313, in description See Col. 1, Lines 14-21, Col. 2, Lines 46-52), comprising: setting pixel at each of intersections of particular ones of the plurality of scanning lines and particular ones of plurality of data lines to be in a display state while remaining pixels are set to be in a non-display state (See Fig. 3, items 303, 305, in description See Col. 2, Lines 21-31); selecting particular scanning lines, one line for every horizontal scanning period with the selection voltage supplied to the selected scanning line (See Fig. 4, items 414, 416, 424, 420, Col. 5, Lines 19-27 and Col. 7, Lines 8-19), the polarity of the selection voltage being inverted with respect to an intermediate value between an on-display voltage and an off-display voltage, supplied to the data line (See Fig. 4, items 414, 416, 424, 420, Col. 7, Lines 40-49); supplying each of the particular data lines with the on-display voltage in accordance

Art Unit: 2673

with a content to be displayed on a pixel at an intersection of the selected scanning line and the particular data line for period during which the selection voltage is supplied to the selected scanning line, within one horizontal scanning period for selecting one of the particular scanning lines (See Fig. 4, items 424, 444, 420, 311, in description See Col. 6, Lines 5-14).

Rader does not show one of two split halves of the one horizontal scanning period every two or more horizontal scanning periods, the particular data line being supplied with the on-display voltage and off-lighting voltage for substantially equal periods within the one horizontal scanning period for the selected scanning line and supplying the data line other than the particular data lines with the non-lighting voltage for a period during which the particular scanning lines are consecutively selected in response to the polarity of the selection voltage supplied to the selected scanning lines, wherein the polarity of the non-lighting voltage is inverted in synchronization with the period of polarity inversion of the selection voltage.

Kumagawa et al. teaches one of two split halves of the one horizontal scanning period every and the particular data line being supplied with the lighting voltage and the non-lighting voltage for substantially equal periods within the one horizontal scanning period for the selected scanning line (See Figs. 25-26, items 202, 206, from Col. 34 ,Line 63 to Col. 35, Line 6), supplying different polarity voltages during in different halves of scanning horizontal scanning period (See Figs. 25-26, items 202, 206, from Col. 34 ,Line 63 to Col. 35, Line 6).

It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate one of two split halves of the one horizontal scanning period and the particular data line being supplied with the lighting voltage and the non-lighting voltage for substantially equal periods within the one horizontal scanning period for the selected scanning line as shown by Kumagawa et al. in the Rader method in order to use a compact and inexpensive LCD provided by improving a drive method for compensating a crosstalk (See Abstract in Kumagawa et al. reference).

Rader and Kumagawa et al. do not show supplying each of scanning lines other than particular scanning lines with a non-selection voltage which is inverted in polarity with respect to the intermediate value every one or more vertical scanning periods.

Kudo et al. teaches to supply each of scanning lines other than particular scanning lines with a non-selection voltage which is inverted in polarity with respect to the intermediate value every one or more vertical scanning periods (See Fig. 13, items 1301-1303, in description See Col. 25, Lines 42-54).

It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate supply each of scanning lines other than particular scanning lines with a non-selection voltage which is inverted in polarity with respect to the intermediate value every one or more vertical scanning periods as shown by Kudo et al. in the Rader and Kumagawa et al. method in order to enable to prevent occurrences of possible image quality degradation phenomena (See Col. 5, Lines 1-2 in Kudo et al. reference).

Rader, Kumagawa et al. and Kubo et al. do not show the polarity of the selection voltage being inverted with respect to an intermediate value between a lighting voltage and non-lighting voltage, supplied to the data line, every two or more horizontal scanning periods.

Takahara et al. teaches polarity of the selection voltage being inverted every two horizontal scanning periods (See Figs. 12-13, item 101b, in description See Col. 20, Lines 43-45).

It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate polarity of the selection voltage being inverted every two horizontal scanning periods as shown by Takahara et al. in the Kudo et al., Rader and Kumagawa et al. method for particular scanning lines in order to provide a method for displaying image signals without causing any deterioration of image quality (See Col. 2, Lines 41-46 in the Takahura et al. reference).

As to claim 6, Rader teaches a driving circuit of a display device for driving pixels are arranged at each of intersections of a plurality of scanning lines and plurality of data lines (See Fig. 3, items 200, 311, 313, in description See Col. 1, Lines 14-21, Col. 2, Lines 46-52), in which a pixel at each of intersections of particular ones of the plurality of scanning lines and particular ones of plurality of data lines is to set to be in a display state while remaining pixels are set to be in a non-display state (See Fig. 3, items 303, 305, in description See Col. 2, Lines 21-31), the driving circuit comprising: a scanning driving and data driving circuits (See Fig. 3, items 311, 313), wherein the scanning drive circuit selects particular scanning lines one line for every horizontal scanning period with

Art Unit: 2673

the selection voltage supplied to the selected scanning line (See Fig. 4, items 414, 416, 424, 420, Col. 5, Lines 19-27 and Col. 7, Lines 8-19), inverts the polarity of the selection voltage being inverted with respect to an intermediate value between an on-display voltage and an off-display voltage, supplied to the data line (See Fig. 4, items 414, 416, 424, 420, Col. 7, Lines 40-49); the data line driving circuit supplies each of the particular data lines with the on-display voltage in accordance with a content to be displayed on a pixel at an intersection of the selected scanning line and the particular data line for period during which the selection voltage is supplied to the selected scanning line, within one horizontal scanning period for selecting one of the particular scanning lines (See Fig. 4, items 424, 444, 420, 311, in description See Col. 6, Lines 5-14).

Rader does not show one of two split halves of the one horizontal scanning period every two or more horizontal scanning periods, the particular data line being supplied with the on-display voltage and off-lighting voltage for substantially equal periods within the one horizontal scanning period for the selected scanning line and supplying the data line other than the particular data lines with the non-lighting voltage for a period during which the particular scanning lines are consecutively selected in response to the polarity of the selection voltage supplied to the selected scanning lines, wherein the polarity of the non-lighting voltage is inverted in synchronization with the period of polarity inversion of the selection voltage.

Kumagawa et al. teaches one of two split halves of the one horizontal scanning period every and the particular data line being supplied with the lighting voltage and the

Art Unit: 2673

non-lighting voltage for substantially equal periods within the one horizontal scanning period for the selected scanning line (See Figs. 25-26, items 202, 206, from Col. 34 ,Line 63 to Col. 35, Line 6), supplying different polarity voltages during in different halves of scanning horizontal scanning period (See Figs. 25-26, items 202, 206, from Col. 34 ,Line 63 to Col. 35, Line 6).

It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate one of two split halves of the one horizontal scanning period and the particular data line being supplied with the lighting voltage and the non-lighting voltage for substantially equal periods within the one horizontal scanning period for the selected scanning line as shown by Kumagawa et al. in the Rader circuit in order to use a compact and inexpensive LCD provided by improving a drive method for compensating a crosstalk (See Abstract in Kumagawa et al. reference).

Rader and Kumagawa et al. do not show supplying each of scanning lines other than particular scanning lines with a non-selection voltage which is inverted in polarity with respect to the intermediate value every one or more vertical scanning periods.

Kudo et al. teaches to supply each of scanning lines other than particular scanning lines with a non-selection voltage which is inverted in polarity with respect to the intermediate value every one or more vertical scanning periods (See Fig. 13, items 1301-1303, in description See Col. 25, Lines 42-54).

It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate supply each of scanning lines other than particular scanning lines with a non-selection voltage which is inverted in polarity with respect to the

Art Unit: 2673

intermediate value every one or more vertical scanning periods as shown by Kudo et al. in the Rader and Kumagawa et al. circuit in order to enable to prevent occurrences of possible image quality degradation phenomena (See Col. 5, Lines 1-2 in Kudo et al. reference).

Rader, Kumagawa et al. and Kubo et al. do not show the polarity of the selection voltage being inverted with respect to an intermediate value between a lighting voltage and non-lighting voltage, supplied to the data line, every two or more horizontal scanning periods.

Takahara et al. teaches polarity of the selection voltage being inverted every two horizontal scanning periods (See Figs. 12-13, item 101b, in description See Col. 20, Lines 43-45).

It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate polarity of the selection voltage being inverted every two horizontal scanning periods as shown by Takahara et al. in the Kudo et al., Rader and Kumagawa et al. circuit for particular scanning lines in order to provide a method for displaying image signals without causing any deterioration of image quality (See Col. 2, Lines 41-46 in the Takahura et al. reference).

As to claims 4,9, Rader teaches for a duration of time during which the scanning lines other the particular scanning lines are consecutively selected, the data lines are supplied with a signal having a positive voltage portion and a negative voltage portion with respect to the intermediate value, the signal alternating between the positive voltage portion and the negative portion with respect to the intermediate value every

Art Unit: 2673

one or more horizontal scanning periods (See Fig. 4, items 420, 305, 424, 200, in Description See Col. 7, Lines 40-49).

As to claim 11, Rader teaches a display device for driving pixels are arranged at each of intersections of a plurality of scanning lines and plurality of data lines (See Fig. 3, items 200, 311, 313, in description See Col. 1, Lines 14-21, Col. 2, Lines 46-52), in which a pixel at each of intersections of particular ones of the plurality of scanning lines and particular ones of plurality of data lines is to set to be in a display state while remaining pixels are set to be in a non-display state (See Fig. 3, items 303, 305, in description See Col. 2, Lines 21-31), the driving circuit comprising: a scanning driving and data driving circuits (See Fig. 3, items 311, 313), wherein the scanning drive circuit selects particular scanning lines one line for every horizontal scanning period with the selection voltage supplied to the selected scanning line (See Fig. 4, items 414, 416, 424, 420, Col. 5, Lines 19-27 and Col. 7, Lines 8-19), the polarity of the selection voltage being inverted with respect to an intermediate value between an on-display voltage and an off-display voltage, supplied to the data line (See Fig. 4, items 414, 416, 424, 420, Col. 7, Lines 40-49); the data line driving circuit supplies each of the particular data lines with the on-display voltage in accordance with a content to be displayed on a pixel at an intersection of the selected scanning line and the particular data line for period during which the selection voltage is supplied to the selected scanning line, within one horizontal scanning period for selecting one of the particular scanning lines (See Fig. 4, items 424, 444, 420, 311, in description See Col. 6, Lines 5-14).

Rader does not show one of two split halves of the one horizontal scanning period every two or more horizontal scanning periods, the particular data line being supplied with the on-display voltage and off-lighting voltage for substantially equal periods within the one horizontal scanning period for the selected scanning line and supplying the data line other than the particular data lines with the non-lighting voltage for a period during which the particular scanning lines are consecutively selected in response to the polarity of the selection voltage supplied to the selected scanning lines, wherein the polarity of the non-lighting voltage is inverted in synchronization with the period of polarity inversion of the selection voltage.

Kumagawa et al. teaches one of two split halves of the one horizontal scanning period every and the particular data line being supplied with the lighting voltage and the non-lighting voltage for substantially equal periods within the one horizontal scanning period for the selected scanning line (See Figs. 25-26, items 202, 206, from Col. 34 ,Line 63 to Col. 35, Line 6), supplying different polarity voltages during in different halves of scanning horizontal scanning period (See Figs. 25-26, items 202, 206, from Col. 34 ,Line 63 to Col. 35, Line 6).

It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate one of two split halves of the one horizontal scanning period and the particular data line being supplied with the lighting voltage and the non-lighting voltage for substantially equal periods within the one horizontal scanning period for the selected scanning line as shown by Kumagawa et al. in the Rader circuit in order to use

Art Unit: 2673

a compact and inexpensive LCD provided by improving a drive method for compensating a crosstalk (See Abstract in Kumagawa et al. reference).

Rader and Kumagawa et al. do not show supplying each of scanning lines other than particular scanning lines with a non-selection voltage which is inverted in polarity with respect to the intermediate value every one or more vertical scanning periods.

Kudo et al. teaches to supply each of scanning lines other than particular scanning lines with a non-selection voltage which is inverted in polarity with respect to the intermediate value every one or more vertical scanning periods (See Fig. 13, items 1301-1303, in description See Col. 25, Lines 42-54).

It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate supply each of scanning lines other than particular scanning lines with a non-selection voltage which is inverted in polarity with respect to the intermediate value every one or more vertical scanning periods as shown by Kudo et al. in the Rader and Kumagawa et al. circuit in order to enable to prevent occurrences of possible image quality degradation phenomena (See Col. 5, Lines 1-2 in Kudo et al. reference).

Rader, Kumagawa et al. and Kubo et al. do not show the polarity of the selection voltage being inverted with respect to an intermediate value between a lighting voltage and non-lighting voltage, supplied to the data line, every two or more horizontal scanning periods.

Art Unit: 2673

Takahara et al. teaches polarity of the selection voltage being inverted every two horizontal scanning periods (See Figs. 12-13, item 101b, in description See Col. 20, Lines 43-45).

It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate polarity of the selection voltage being inverted every two horizontal scanning periods as shown by Takahara et al. in the Kudo et al., Rader and Kumagawa et al. circuit for particular scanning lines in order to provide a method for displaying image signals without causing any deterioration of image quality (See Col. 2, Lines 41-46 in the Takahura et al. reference).

As to claim 15, Rader teaches electronic equipment comprising a display device (See FIG. 2, item 100, 200, in description See from Col. 1, Line 59 to Col. 2, Line 9).

2. Claims 5, 10, are rejected under 35 U.S.C. 103(a) as being unpatentable over Rader, Kumagawa et al., Kudo et al. and Takahara et al. as aforementioned in claims 4, 9 in view of Yokota et al. (US Patent No. 6,181,313 B1).

Rader, Kumagawa et al., Kudo et al. and Takahara et al. do not show the polarity inversion period of the signal having the positive and negative voltage portion is a fraction of the horizontal scanning period determined by dividing the total number of scanning lines other than particular scanning lines by an integer number equal two or more.

Yokota et al. teaches a drive duty selection register (See Fig. 1, items 3, 34, in description See Col. 8, lines 43-53 and Col. 9, Lines 64-68).

It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate duty cycle control as shown Yokota et al. in the Rader, Kumagawa et al., Kudo et al. and Takahara et al. apparatus and method to control polarity of the inversion period for the scanning lines other than the particular scanning lines in order to improve the display for cellular radiotelephone, pager and so on.

3. Claims 12-14 rejected under 35 U.S.C. 103(a) as being unpatentable over Rader, Kumagawa et al., Kudo et al. and Takahara et al. as aforementioned in claim 11 in view of Shimada (US Patent No. 6, 512, 506 B1).

As to claim 12, Rader, Kumagawa et al., Kudo et al. and Takahara et al. do not show a switching element and capacitive element containing an electro-optical material, wherein when one scanning line is supplied with the selection voltage, the switching element of the pixel assigned to the selected scanning line becomes conductive and writing is performed on a capacitive element corresponding to the switching element in response to an on-display voltage supplied to the corresponding data line.

Shimada teaches a switching element and capacitive element containing an electro-optical material, wherein when one scanning line is supplied with the selection voltage, the switching element of the pixel assigned to the selected scanning line becomes conductive and writing is performed on a capacitive element corresponding to the switching element in response to a lighting voltage supplied to the corresponding data line (See Fig. 2, items 2a, 2b, Ym, Xn, in description See Col. 9, lines 26-41).

Art Unit: 2673

It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate switching and a capacitive element as shown by Shimada in the Rader , Kumagawa et al., Kudo et al. and Takahara et al. apparatus and method in order to improve power consumption (See Col. 8, Lines 35-39 in the Shimada reference).

As to claims 12-13, Shimada teaches the switching element is a two-terminal switching element (MIM or conductor-insulator-conductor) and the capacitive element connected in series between scanning line and data line (See Fig. 2, items 2a, 2b, Ym, Xn, in description See Col. 9, lines 26-41).

Allowable Subject Matter

4. Claims 2-3 and 7-8 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance:

Relative to claims 2-3 and 7-8 the major difference between the teaching of the prior art of record (Rader, Kumagawa et al, Kudo et al. and Takahara et al.) and the instant invention is that the said prior art **does not teach** the selected scanning line is supplied with the selection voltage for a second half of the horizontal scanning period and when a subsequent scanning line is selected, the selected scanning line is supplied with the selection voltage for a first half of one horizontal scanning period.

Response to Arguments

8. Applicant's arguments filed on 03.25.05 with respect to claims 1, 4-6, 9-15 have been fully considered, but they are not persuasive:

On page 10, last paragraph of Remarks, Applicant's stated that neither Rader, Kumagawa, Kudo nor Takahara alone or in combination, teach or a driving method of a display device for driving pixels including selecting particular scanning lines, one for every horizontal scanning period with a selection voltage supplied to the selected scanning line for one of two split halves of the one horizontal scanning period; the polarity of the selection voltage being inverted every two or more horizontal scanning periods; supplying each of the scanning lines other than the particular scanning lines with a non-selection voltage which is inverted in polarity with respect to the intermediate value every one or more vertical scanning periods; the particular data line being supplied with the on-display voltage and the off display voltage for substantially equal periods within the one horizontal scanning period for the selected scanning line; supplying the data line other than the particular data lines with the off- display voltage for a period during which the particular scanning lines are consecutively selected; and the polarity of the off-display voltage is inverted in synchronization with the period of polarity inversion of the selection voltage, as set forth in independent claim 1 and similarly set forth in independent claims 6 and 11. However, Examiner disagrees, that combination of above mention references does not teach or suggest this driving method.

Art Unit: 2673

On pages 11-13 of Remarks, Applicant's attacks references individually in a 103 rejection. For example, on page 13, 2nd paragraph Applicant's stated that Kudo does not teach a particular data line being supplied with on-display voltage and off-display voltage for substantially **equal** periods within one horizontal scanning period for selected scanning line. However, Kumagawa et al. reference teaches one of two split halves of the one horizontal scanning period every and particular line being supplied with the lighting voltage and the non-lighting voltage for substantially equal periods within one horizontal scanning period for selected scanning line (See Figs. 25-26, item 202, 206, from Col. 34, Line 63 to Col. 35, Line 6). Therefore, Applicant's cannot show non-obviousness by attacking references individually where, as here the rejections are based on combination references. In re Keller, 208 USPQ 871 (CCPA 1981).

Telephone inquire

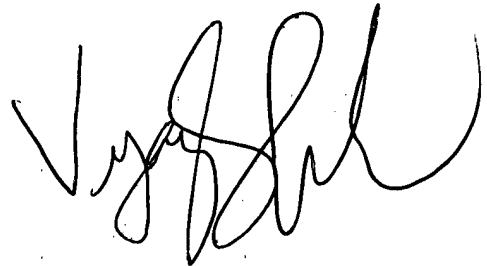
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonid Shapiro whose telephone number is 571-272-7683. The examiner can normally be reached on 8 a.m. to 5 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on 571-272-7681. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2673

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LS
07.14.05

A handwritten signature in black ink, appearing to read 'Vijay Shankar', with a stylized, cursive script.

VIJAY SHANKAR
PRIMARY EXAMINER